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MASSACHUSETTS NATURAL HERITAGE PROGRAM

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Plant Community Classification

GOVERNMENT DOCUMENTS COLLECTION
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University of Massachusetts
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I. Need for a Plant Community Classification for Massachusetts

The Massachusetts Natural Heritage Program (MASS-NHP) was established in 1978 as a cooperative venture between the Massachusetts Department of Environmental Management and The Nature Conservancy. Our ultimate concern is the preservation of ecological diversity through the protection of significant natural areas. We are creating a central repository for ecological information which can have important applications in environmental review processes such as NEPA and MEPA impact statements and the A-95 review. Thus, MASS-NHP will aid in the development of ecologically-sound planning to safeguard our natural features during the state's continued growth.

Plant community types are one element of natural diversity upon which we are focusing; the others include endangered plant and animal species, aquatic communities and landscape features. The preservation of plant community types is especially important in Massachusetts because of changes in land use patterns. Urban expansion and the substantial loss of wetland areas have resulted in significant modifications of our landscape. Consequently, an up-to-date listing of the more stable plant community types is lacking for Massachusetts. It is imperative that these be identified and protective measures taken before any more of our unique ecological associations are destroyed or permanently altered.

II. What Constitutes a Significant and Stable Plant Community?

We have limited the focus of our classification system to better meet the specific goals of our program. Rather than attempting to create a classification which includes all the vegetation found within the state, we are concentrating on three types of communities: old-growth stands, seral but long-lasting communities, and areas of unique habitat. The level of stability is a key factor. We are interested in communities which are stable, either because there has been no drastic disturbance for a long period of time (synonymous with an old-growth stand) or because the level of disturbance has been constant and therefore a natural dynamic equilibrum has been reached (e.g., fire-maintained or dune communities). In addition, we are looking for community types which are uncommon and therefore indicators of unique habitat. For example, many wetland communities such as bogs, marshes, and ponds, while successional in nature, are still indicative of unusual habitat.

Many questions arise when trying to fit highly variable plant communities into the framework of a particular classification system. We need your input in defining the amount of variability acceptable within a plant community type. We also welcome your ideas on how these units should be

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combined or expanded to make them more representative of the actual vegetation.

III. Compilation of this Preliminary Classification

This classification was compiled almost exclusively from literature sources, primarily Rhodora and student research papers. At this time we are continuing to systematically survey and catalog all the pertinent literature of the past century for plant community information. However, we are often constrained where no recent data exists; many of the described plant communities are no longer found within the state. In addition, it has been difficult to extrapolate from the local floristic lists to the community level and still maintain a clear idea of community composition and type.

Guidelines from other Heritage Programs and from the National Office of The Nature Conservancy have been useful in establishing our classification system. This information is now being supplemented by an intensive field inventory effort.

IV. Organization of the Classification System

This classification follows the format established by ecologists at the National Office of The Nature Conservancy. Stands of vegetation which are similar with respect to certain pre-determined criteria are grouped into abstract units called communities; this provides a framework within which the actual vegetation on the ground can be placed. Although this plant community classification is somewhat artificial, it provides a standardized system necessary for effective data management. Through the use of this same format in all state Heritage Programs, a national perspective on vegetation types and protection needs can be reached.

This classification system is hierarchial in nature, a feature which has several advantages for our purposes. It allows for a more directed and efficient field inventory effort by highlighting existing gaps in data collection. In addition, it aids in the process of vegetation mapping and allows for quick comparison between units of similar levels. This structure also provides a level of comparability which accentuates the variety of vegetation types found within Massachusetts.

This classification system is first divided into systems, i.e., forest, shrub and herbaceous. Under the forest system there are three groupings: deciduous, evergreen and mixed forest. A definition for each has been incorporated into the classification. The Vegetation Cover Class is derived from the dominant genus or co-dominant genera in the overstory. While the definition of "dominant" remains flexible, it was used here to indicate greater

than 50 per cent cover for dominants or at least 20 per cent cover for each co-dominant. In cases where there were three or more co-dominants or where no dominants or co-dominants could be specified, qualifiers were used to describe these communities (e.g., Xerophytic Mixed Oaks or Coastal Swamp Thicket). The Cover Type was derived from the dominant or characteristic species in the overstory. Under this are listed the associated species for the type; these will eventually be refined into stratal dominants after quantitative sampling.

The two examples outlined below will make this organizational structure more apparent.

A. Needleleaf Forest System

AA. Picea-Abies Cover Class

AA.A Picea rubra -- Abies balsamea Cover Type

Assoc. Species: Clintonia borealis
Lycopodium lucidulum
Viburnum alnifolium

B. Herbaceous (Graminoid and Forb) System

BA. Spartina Cover Class

BA.A Spartina patens Cover Type

V. Where Do We Go From Here?

This fall we plan to continue with our field inventory effort and sample representative examples of the major community types found in Massachusetts. This work will be continued on a larger scale during the next field season. We will also be gathering all of your comments and developing the second draft of the plant community classification.

During the Spring of 1980, we plan to organize a meeting of Massachusetts plant ecologists to collectively discuss this newly synthesized classification. This meeting will hopefully provide an impetus for continued work in this area and stimulate a renewed interest in the study of Massachusetts plant communities. If you would like to participate in this conference, please indicate your interest on the enclosed form and return it with your comments.

MASSACHUSETTS NATURAL HERITAGE PROGRAM

Plant Community Classification

A. Broadleaf Deciduous Forest System (defined as > 50% tree cover, more than 75% of which is composed of broadleaf trees)

AA. *Fagus* Cover Class (Beech)

AA.A *Fagus grandifolia* Cover Type

AB. *Fagus-Acer* Cover Class (Beech-Maple)

AB.A *Fagus grandifolia* -- *Acer saccharum* Cover Type

AC. *Fagus-Acer-Betula* Cover Class (Beech-Maple-Birch)

AC.A *Fagus grandifolia* -- *Acer saccharum* -- *Betula alleghaniensis* Cover Type

Assoc. Species: *Tsuga canadensis*
Pinus strobus
Fraxinus americana
Quercus rubra
Prunus serotina

AD. *Fagus-Acer-Quercus* Cover Class (Beech-Maple-Oak)

AD.A *Fagus grandifolia* -- *Acer rubrum* -- *Quercus alba* Cover Type

Assoc. Species: *Quercus velutina*
Pinus rigida
Sassafras albidum
Betula lenta
Betula alleghaniensis
Carya spp.

AE. *Fagus-Quercus-Sassafras* Cover Class (Beech-Oak-Sassafras)

AE.A *Fagus grandifolia* -- *Quercus alba* -- *Sassafras albidum* Cover Type

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AF. Fagus-Ilex Cover Class (Beech-Holly)

AF.A Fagus grandifolia -- Ilex opaca Cover Type

AG. Acer Cover Class (Maple)

AG.A Acer saccharum Cover Type

AG.A Acer rubrum Cover Type

Assoc. Species: Vaccinium corymbosum
Rhododendron viscosum
Alnus rugosa

AH. Acer-Amelanchier Cover Class (Maple-Shadbush)

AH.A Acer rubrum -- Amelanchier sp. Cover Type

Assoc. Species: Clethra alnifolia
Lyonia ligustrina
Rhododendron viscosum
Decodon verticillatus

AI. Acer-Fraxinus Cover Class (Maple-Ash)

AI.A Acer rubrum -- Fraxinus nigra Cover Type

Assoc. Species: Nyssa sylvatica
Quercus bicolor
Rhus vernix

AJ. Acer-Betula Cover Class (Maple-Birch)

AJ.A Acer rubrum -- Betula alleghaniensis Cover Type

Assoc. Species: Tsuga canadensis
Fraxinus nigra

AK. Acer-Ulmus Cover Class (Maple-Elm)

AK.A Acer rubrum -- Ulmus americana Cover Type

Assoc. Species: Betula lenta
Quercus rubra

AK.B Acer saccharinum -- Ulmus americana Cover Type

AL. Acer-Salix Cover Class (Maple-Willow)

AL.A Acer negundo -- Salix nigra Cover Type

AM. Quercus Cover Class (Oak)

AM.A Quercus spp. (Xerophytic Mixed Oaks)

Represented by: Quercus coccinea
Quercus velutina
Quercus prinus
(lesser amounts of Q. alba & Q. rubra)

AM.B Quercus spp. (Dry Mesophytic Oaks)

Represented by: Quercus alba
Quercus velutina
Quercus coccinea
(lesser amounts of Q. rubra)

AM.C Quercus spp. (Mesophytic Mixed Oaks)

Represented by: Quercus rubra
Quercus alba

AM.D Quercus rubra Cover Type

AN. Quercus-Carya Cover Class (Oak-Hickory)

AN.A Quercus spp. -- Carya spp. Cover Type

Represented by: Quercus rubra
Quercus velutina
Quercus alba
Quercus prinus
Quercus coccinea
Carya glabra
Carya ovata
Carya cordiformis

AO. Quercus-Acer Cover Class (Oak-Maple)

AO.A Quercus rubra -- Acer rubrum Cover Type

Assoc Species: Betula papyrifera
Betula lenta
Quercus alba
Fraxinus americana
Betula alleghaniensis

AO.B *Quercus bicolor* -- *Acer rubrum* -- *Acer saccharinum* Cover Type

AP. *Quercus*-*Acer*-*Fraxinus* Cover Class (Oak-Maple-Ash)

AP.A *Quercus rubra* -- *Acer rubrum* -- *Fraxinus americana* Cover Type

AQ. *Quercus*-*Acer*-*Prunus* Cover Class (Oak-Maple-Cherry)

AQ.A *Quercus rubra* -- *Acer rubrum* -- *Prunus serotina* Cover Type

AR. *Prunus* Cover Class (Cherry)

AR.A *Prunus serotina* Cover Type

Assoc. Species: *Fagus grandifolia*
Acer saccharum
Betula alleghaniensis

AS. *Ulmus*-*Fraxinus* Cover Class (Elm-Ash)

AS.A *Ulmus americana* -- *Fraxinus americana* Cover Type

AT. *Populus*-*Platanus* Cover Class (Poplar-Sycamore)

AT.A *Populus deltoides* -- *Platanus occidentalis* Cover Type

Assoc. Species: *Sambucus canadensis*
Cornus amomum
Vitis sp.
Parthenocissus quinquefolia

AU. *Nyssa*-*Celtis*-*Prunus* Cover Class (Sourgum-Hackberry-Cherry)

AU.A *Nyssa sylvatica* -- *Celtis occidentalis* -- *Prunus serotina* Cover Type

Assoc. Species: *Acer rubrum*
Lonicera sp.

C. Needleleaf Forest System (defined as > 50% tree cover, more than 75% of which is composed of needleleaf trees)

CA. *Picea* Cover Class (Spruce)

CA.A *Picea rubra* Cover Type

CA.B *Picea mariana* Cover Type

CB. *Picea-Abies* Cover Class (Spruce-Fir)

CB.A *Picea rubra* -- *Abies balsamea* Cover Type

CC. *Picea-Larix* Cover Class (Spruce-Larch)

CC.A *Picea mariana* -- *Larix laricina* Cover Type

Assoc. Species: *Thuja occidentalis*
Tsuga canadensis
Acer rubrum

CD. *Larix* Cover Class (Larch)

CD.A *Larix laricina* Cover Type

CE. *Tsuga* Cover Class (Hemlock)

CE.A *Tsuga canadensis* Cover Type

CF. *Pinus* Cover Class (Pine)

CF.A *Pinus strobus* Cover Type

CF.B *Pinus rigida* Cover Type

Assoc. Species: *Quercus ilicifolia*
Vaccinium spp.
Kalmia sp.
Myrica pensylvanica

CF.C *Pinus resinosa* Cover Type

CG. Pinus-Tsuga Cover Class (Pine-Hemlock)

CG.A Pinus strobus -- Tsuga canadensis Cover Type

CH. Pinus-Juniperus Cover Class (Pine-Juniper)

CH.A Pinus rigida -- Juniperus virginiana Cover Type

Assoc. Species: Sassafras albidum
Prunus serotina

CI. Chamaecyparis Cover Class (Atlantic White Cedar)

CI.A Chamaecyparis thyoides Cover Type

Assoc. Species: Acer rubrum
Ilex opaca
Tsuga canadensis
Kalmia latifolia

CJ. Thuja Cover Class (Northern White Cedar)

CJ.A Thuja occidentalis Cover Type

E. Mixed Broadleaf--Needleleaf Forest System (defined as > 50% tree cover, composed of more than 25% broadleaf trees and more than 25% needleleaf trees)

EA. Picea-Betula Cover Class (Spruce-Birch)

EA.A Picea rubra -- Betula alleghaniensis Cover Type

Assoc. Species: Fagus grandifolia
Acer saccharum

EA.B Picea rubra -- Picea mariana -- Betula alleghaniensis Cover Type

E Assoc. Species: Abies balsamea
Thuja occidentalis

EB. Picea-Abies-Betula Cover Class (Spruce-Fir-Birch)

EB.A Picea rubra -- Abies balsamea -- Betula alleghaniensis Cover Type

Assoc. Species: Betula papyrifera
Betula papyrifera var cordifolia
Fagus grandifolia
Sorbus americana

EC. Picea-Abies-Acer Cover Class (Spruce-Fir-Maple)

EC.A Picea rubra -- Abies balsamea -- Acer rubrum Cover Type

Assoc. Species: Fraxinus nigra

ED. Picea-Tsuga-Acer Cover Class (Spruce-Hemlock-Maple)

ED.A Picea rubra -- Tsuga canadensis -- Acer rubrum Cover Type

Assoc. Species: Betula alleghaniensis
Nyssa sylvatica
Larix laricina

EE. Fagus-Tsuga Cover Class (Beech-Hemlock)

EE.A Fagus grandifolia -- Tsuga canadensis Cover Type

Assoc. Species: Acer saccharum
Betula alleghaniensis

EF. Tsuga-Betula Cover Class (Hemlock-Birch)

EF.A Tsuga canadensis -- Betula alleghaniensis Cover Type

Assoc. Species: Quercus rubra
Acer saccharum
Fagus grandifolia

EG. Tsuga-Pinus-Quercus Cover Class (Hemlock-Pine-Oak)

EG.A Tsuga canadensis -- Pinus strobus -- Quercus rubra Cover Type

Assoc. Species: Acer rubrum
Betula lenta

EH. Tsuga-Acer Cover Class (Hemlock-Maple)

EH.A Tsuga canadensis -- Acer rubrum Cover Type

Assoc. Species: Betula spp.
Quercus alba
Pinus strobus

EI. Tsuga-Acer-Quercus Cover Class (Hemlock-Maple-Oak)

EI.A Tsuga canadensis -- Acer rubrum -- Quercus rubra Cover Type

Assoc. Species: Betula papyrifera
Betula lenta
Pinus strobus

EJ. Tsuga-Acer-Betula Cover Class (Hemlock-Maple-Birch)

EJ.A Tsuga canadensis -- Acer rubrum -- Betula alleghaniensis Cover Type

Assoc. Species: Pinus strobus
Quercus rubra

EK. Pinus-Quercus Cover Class (Pine-Oak)

EK.A Pinus strobus -- Quercus rubra Cover Type

Assoc. Species: Acer rubrum
Fraxinus americana
Quercus alba

EK.B *Pinus strobus* -- *Quercus velutina* Cover Type

Assoc. Species: *Quercus prinus*
Quercus coccinea
Betula lenta

EK.C *Pinus rigida* -- *Quercus velutina* Cover Type

Assoc. Species: *Prunus serotina*
Amelanchier sp.

EK.D *Pinus rigida* -- *Quercus velutina* -- *Quercus alba* Cover Type

Assoc. Species: *Sassafras albidum*
Ilex opaca
Prunus serotina
Acer rubrum
Nyssa sylvatica

EK.E *Pinus rigida* -- *Quercus ilicifolia* Cover Type

EL. *Pinus-Quercus-Carya* Cover Class (Pine-Oak-Hickory)

EL.A *Pinus strobus* -- *Quercus* spp. -- *Carya* spp. Cover Type

Assoc. Species: *Betula* spp.
Populus spp.

EM. *Pinus-Quercus-Ilex* Cover Class (Pine-Oak-Holly)

EM.A *Pinus rigida* -- *Quercus stellata* -- *Ilex opaca* Cover Type

Assoc. Species: *Quercus* spp.

EN. *Chamaecyparis-Acer* Cover Class (Atlantic White Cedar-Maple)

EN.A *Chamaecyparis thyoides* -- *Acer rubrum* Cover Type

Assoc. Species: *Vaccinium corymbosum*
Kalmia angustifolia
Ilex glabra
Lyonia ligustrina

J. Shrub System

JA. Alnus Cover Class (Alder)

JA.A Alnus rugosa Cover Type

JB. Alnus-Salix Cover Class (Alder-Willow)

JB.A Alnus rugosa -- Salix spp. Cover Type

Assoc. Species: Cornus spp.

JC. Costal Swamp Thicket

JC.A Clethra alnifolia -- Vaccinium corymbosum -- Rhododendron viscosum -- Ilex verticillata Cover Type

JD. Supratidal Shrubs -- Saltmarsh Edge

JD.A Iva frutescens -- Baccharis halimifolia -- Prunus serotina -- Myrica gale Cover Type

JE. Hudsonia Cover Class (Hudsonia)

JE.A Hudsonia ericoides -- Hudsonia tomentosa Cover Type

Assoc. Species: Lechea maritima
Cladonia spp.

JF. Hudsonia-Myrica Cover Class (Hudsonia-Bayberry)

JF.A Hudsonia ericoides -- Hudsonia tomentosa -- Myrica pensylvanica Cover Type

Assoc. Species: Prunus maritima
Rhus radicans

JG. Myrica Cover Class (Bayberry)

JG.A Myrica gale -- Ericad Swamp Cover Type

Assoc. Species: Chamaedaphne calyculata
Kalmia angustifolia
Vaccinium corymbosum

JH. Myrica-Prunus Cover Class (Bayberry-Cherry)

JH.A Myrica pensylvanica -- Prunus maritima Cover Type

Assoc. Species: Rosa rugosa
Rosa virginiana
Rhus radicans

JH.B Myrica sp. -- Prunus serotina Cover Type

Assoc. Species: Rhus copallina
Ilex verticillata
Gaylussacia baccata

JI. Myrica-Alnus-Chamaedaphne Cover Class (Bayberry-Alder-Leatherleaf)

JI.A Myrica gale -- Alnus rugosa -- Chamaedaphne calyculata Cover Type

JJ. Myrica-Vaccinium Cover Class (Bayberry-Ericad)

JJ.A Myrica sp. -- Vaccinium spp. Cover Type

JK. Cephalanthus Cover Class (Buttonbush)

JK.A Cephalanthus occidentalis Cover Type

JL. Quercus Cover Class (Oak)

JL.A Quercus ilicifolia Cover Type

JM. Kalmia Cover Class (Laurel)

JM.A Kalmia latifolia Cover Type

JN. Vaccinium Cover Class (Ericad)

JN.A Vaccinium spp. Cover Type

JO. Vaccinium-Sphagnum Cover Class (Ericad-Sphagnum)

JO.A Vaccinium macrocarpon -- Vaccinium oxycoccus -- Sphagnum Cover Type

Assoc. Species: Drosera spp.

JP. Peat Bog Formation

JP.A *Chamaedaphne calyculata* -- *Vaccinium* spp. -- *Kalmia* spp. -- *Ledum groenlandicum* -- *Eriophorum* spp. Cover Type

N. Herbaceous (Graminoid and Forb) System

NA. Zostera Cover Class (Eelgrass)

NA.A Zostera marina Cover Type

Assoc. Species: Various marine algae including
Laminaria sp.
Chorda sp.
Desmerestia sp.
Chondrus sp.

NB. Zostera-Ruppia-Zannichellia Cover Class (Eelgrass-Ditch-grass-Horned Pondweed)

NB.A Zostera marina -- Ruppia maritima -- Zannichellia palustris Cover Type

NC. Salicornia-Suaeda Cover Class (Glasswort-Sea blite)

NC.A Salicornia spp. -- Suaeda spp. Cover Type

ND. Spartina Cover Class (Saltgrass)

ND.A Spartina alterniflora Cover Type

Assoc. Species: Salicornia spp.

ND.B Spartina patens Cover Type

Assoc. Species: Spartina alterniflora

ND.C Spartina patens -- Spartina alterniflora Cover

NE. Spartina-Distichlis Cover Class (saltgrass-Spikegrass)

NE.A Spartina patens -- Distichlis spicata Cover Type

Assoc. Species: Solidago sempervirens
Limonium carolinanum
Aster subulatus
Atriplex patula
Plantago juncoides

NF. Spartina-Panicum Cover Class (Saltgrass-Panic grass)

NF.A Spartina pectinata -- Panicum virgatum Cover Type

NG. *Distichlis* Cover Class (Spikegrass)

NG.A *Distichlis spicata* Cover Type

Assoc. Species: *Suaeda maritima*
Atriplex patula
Iva frutescens

NH. *Juncus* Cover Class (Rush)

NH.A *Juncus gerardii* Cover Type

Assoc. Species: *Suaeda maritima*
Atriplex patula
Iva frutescens

NI. *Scirpus* Cover Class (Bulrush)

NI.A *Scirpus* spp. Cover Type

Represented by: *Scirpus pectinata*
Scirpus cynosuroides
Scirpus americanus

NJ. *Scirpus-Typha-Phragmites* Cover Class (Bulrush-Cattail-Reed)

NJ.A *Scirpus* spp. -- *Typha latifolia* -- *Typha angustifolia* -- *Phragmites communis* Cover Type

NK. *Typha* Cover Class (Cattail)

NK.A *Typha latifolia* -- *Typha angustifolia* Cover Type

Assoc. Species: *Pontederia cordata*
Scirpus validus
Sparganium americanum

NL. *Potamogeton* Cover Class (Pondweed)

NL.A *Potamogeton* spp. Cover Class

Assoc. Species: *Najas* spp.
Eleodea spp.
Vallisneria americana

NM. Potamogeton-Ruppia Cover Class (Pondweed-Ditch-grass)

NM.A Potamogeton pectinatus -- Ruppia maritima Cover Type

NN. Nymphaea-Nuphar-Lemna Cover Class (Water-lily-Spatterdock-Duckweed)

NN.A Nymphaea odorata -- Nuphar variegatum -- Lemna spp. Cover Type

NO. Decodon Cover Class (Swamp loosestrife)

NO.A Decodon verticillatus Cover Type

NP. Salsola-Cakile Cover Class (Saltwort-Sea rocket)

NP.A Salsola kali -- Cakile edentula Cover Type

Assoc. Species: Arenaria spp.

NQ. Ammophila Cover Class (Beach grass)

NQ.A Ammophila breviligulata Cover Type

Assoc. Species: Xanthium echinatum
Lathyrus japonicus
Artemesia stelleriana
Solidago sempervirens
Euphorbia polygonifolia

NR. Sphagnum Mat

NR.A Sphagnum spp. -- Sarracenia purpurea -- Drosera rotundifolia -- Utricularia sp. -- Orchidaceae -- Cyperaceae Cover Type